



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,281	08/18/2003	Michael Andrew Miller	AM-5308.D1	4049

7590 03/16/2005

Patent Counsel
APPLIED MATERIALS, INC.
P.O. Box 450-A
Santa Clara, CA 95052

EXAMINER

VERSTEEG, STEVEN H

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 03/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/643,281

Applicant(s)

MILLER ET AL.

Examiner

Steven H VerSteeg

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/2/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: the patent number of the parent application needs inserted at [0001].

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. In claims 9-12, the claims are out of scope with claim 8 from which they depend. Claim 8 is directed to a sputter reactor with an improvement in the shield. Thus, claim 8 requires more than just the shield. Claims 9-12, on the other hand, appear to claim only the shield. To be in proper scope, claims 9-12 need to be directed to the sputter reactor. Thus, I recommend changing claims 9-12 to read "The sputter reactor of Claim 8" rather than "The shield of Claim 8". Similarly, claims 13 and 14 are directed to a further embodiment of the shield and need to be corrected. I recommend amend claim 13 to read "The sputter reactor of Claim 8 wherein the shield is a first shield and further comprising a second shield fittable within the inner wall of said first shield to cover said perforations." For claim 14, I recommend amending the claim to read, "The sputter reactor of claim 13, wherein said second shield has two generally straight portions connected through a curved portion."

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-4, 6-11, 13, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,730,174 B2 to Liu et al. (Liu)

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

7. For claim 8, Applicant requires a sputter reactor having sidewalls arranged about a central axis, a target of a material to be sputtered, and a substrate to be sputter deposited separated from the target along the central axis.

8. Claims 8 and 1 require a shield usable in a sputter reactor comprising an outer wall extending generally parallel to an axis and including a plurality of perforations therethrough to allow gas to reach from an outer side of the outer wall to an inner side of the outer wall; an inner

Art Unit: 1753

wall extending generally parallel to the axis and closed to the axis than the outer wall; and a bottom wall connecting the inner and outer walls.

9. Liu discloses a sputter reactor comprising a target **230**, substrate **240**, and sidewalls (Figure 1). A shield is present that has an outer wall (the outside of the shield) and an inner wall (the inner side of the shield) with perforations **160** through the shield **145**. The inner and outer walls/sides are connected by a bottom wall (Figure 2).

10. For claims 2 and 9, Applicant requires the perforations to be round. Figure 2 shows the holes **160** to be round.

11. For claims 3 and 10, Applicant requires the outer wall to extend farther along the axis than does the inner wall. Figure 2 shows the outer wall to extend farther than the inner wall.

12. For claims 4 and 11, Applicant requires the shield to be generally symmetric about the axis. Figure 2 shows the shield is symmetric.

13. For claims 6 and 13, Applicant requires a second shield fittable within the inner wall of the first shield to cover the perforations. Figure 2 shows that a second shield is inside the first shield.

14. For claims 7 and 14, Applicant requires the second shield to have two generally straight portions connected through a curved portion. The second shield has two generally straight sections connected through a curved portion (Figure 2).

15. Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,645,357 B2 to Powell

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

Art Unit: 1753

102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

16. Claims 1-4, 6-11, 13, and 14 are described above. Powell discloses a sputtering reactor comprising a target **14**, substrate **18**, and sidewalls (Figure 1). There is a shield present that has an outer wall, inner wall, and perforations in the shield (Figure 1). The perforations are round. The walls of the shield are connected at the bottom. The shield is generally symmetric. A second shield is inside the outer shield with two generally straight portions connected by a curved portion.

17. For claims 5 and 12, Applicant requires the shield to be formed of stainless steel. The shield is made of stainless steel (col. 5, l. 8-9).

18. Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,296,747 B1 to Tanaka

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

19. Claims 1-14 are described above. Tanaka discloses a sputter reactor comprising a target **16**, substrate **18**, and sidewalls (Figure 3). A shield is also present that has round holes **92**. The

Art Unit: 1753

shield has outer, inner, and bottom walls. A second shield is inside the shield and comprises two generally straight portions connected through a curved portion (Figure 3). The shield is made of stainless steel (col. 5, l. 47-48).

20. Claims 1, 2, 4, 8, 9, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,022,461 to Kobayashi et al. (Kobayashi).

21. Claims 1, 2, 4, 8, 9, and 11 are described above. Kobayashi discloses a sputtering reactor (abstract) comprising a target, substrate, and sidewalls (Figure 1(a)). A shield 6 is also present that has a plurality of holes 42 and is symmetric about the center axis. The shield has outer, inner, and bottom walls (Figure 1(a)). The perforations can be round (col. 10, l. 26-27).

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,022,461 to Kobayashi et al. (Kobayashi) in view of US 5,961,793 to Ngan.

24. Claims 5 and 12 are described above. Kobayashi is described above, but does not disclose the material of the shield.

25. Ngan discloses that in sputtering apparatus, the shield and all metal surfaces are typically made of stainless steel to reduce flaking of sputtered material from the shield onto the wafer (col. 8, l. 43-50).

Art Unit: 1753

26. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kobayashi to utilize stainless steel as the shield material because of the desire to reduce flaking and utilize conventional material.

27. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,730,174 B2 to Liu et al. (Liu) in view of US 5,961,793 to Ngan.

28. Claims 5 and 12 are described above. Liu and Ngan are described above. Liu does not disclose the material of the shield.

29. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Liu to utilize stainless steel as the shield material because of the desire to reduce flaking and utilize conventional material.

Double Patenting

30. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

31. Claims 1, 6, 8, and 13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 42 of U.S. Patent No. 6,627,050 B2.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims are fully encompassed by claim 42 of the patent.

Art Unit: 1753

32. Claims 1, 6, 8, and 13 are described above. Claim 42 of the patent claims a sputter deposition reactor comprising a target, substrate, shield comprising a plurality of perforations, and a second shield inside the first shield that covers the perforations. The first shield inherently has inner, outer, and bottom walls.

33. Claims 1, 6, 8, and 13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 7, and 16 of U.S. Patent No. 6,296,747 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims are fully encompassed by the patented claims.

34. Claims 1, 6, 8, and 13 are described above. Claim 16 of the patent, which corresponds to claims 1 and 6 of the instant application, claims a shield comprising a plurality of apertures and a second shield inside the first shield. The first shield inherently has inner, outer, and bottom walls. Claim 1 of the patent, which corresponds to claim 8 of the instant invention, claims a sputter reactor comprising a target and pedestal for supporting a substrate, and first shield comprising a plurality of apertures. The shield inherently has inner, outer, and bottom walls. Claim 7 of the patent, which corresponds to claim 13 of the instant application, claims a second shield inside the first shield.

35. Claims 5 and 12 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 42 of U.S. Patent No. 6,627,050 B2 in view of US 5,961,793 to Ngan. Claims 5 and 12 are described above.

36. Claim 42 of the patent is described above. Ngan is described above. The patent does not claim the material of the shield.

Art Unit: 1753

37. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of the patent to utilize stainless steel as the shield material because of the desire to reduce flaking and utilize conventional material.

38. Claims 5 and 12 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 16 of U.S. Patent No. 6,296,747 B1 in view of US 5,931,793 to Ngan. Claims 5 and 12 are described above.

39. Claims 1 and 16 of the patent are described above. Ngan is described above. The patent does not claim the material of the shield.

40. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of the patent to utilize stainless steel as the shield material because of the desire to reduce flaking and utilize conventional material.

General Information

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.

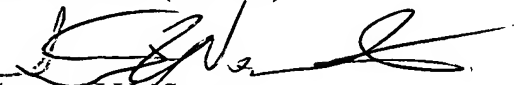
Art Unit: 1753

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
March 10, 2005